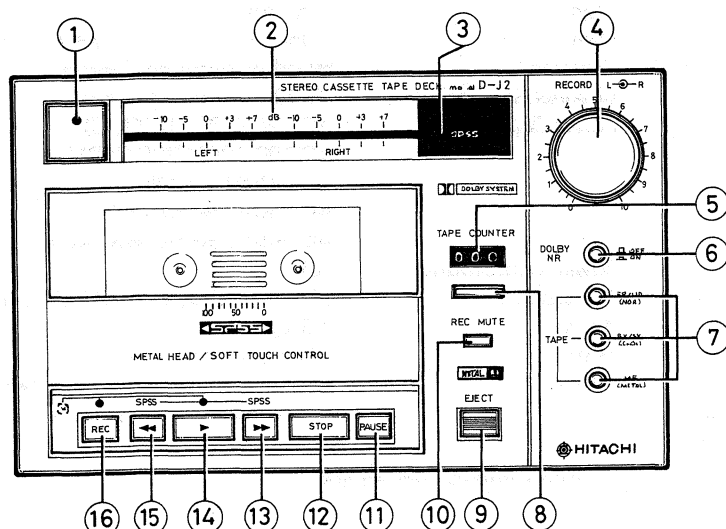


# **HITACHI** **SERVICE MANUAL**

**TK**
**No. 1497E**
**D-J2**
**(U,C,FS,BS,AU,W)**

Use this manual together with the ML-1 Mechanism Technical Information (No.1473).



## CONTENTS


Specifications .....	2
Disassembly .....	2
Adjustment .....	3
Inspection of mechanism .....	4
Lubrication .....	4
Schematic diagram .....	5
Circuit board diagram .....	7
Wiring diagram .....	9
Replacement parts list .....	13
Exploded view (Cabinet) .....	15

## KEY TO ILLUSTRATION

- |                             |                         |
|-----------------------------|-------------------------|
| 1. Power (Mains) switch     | 9. Eject button         |
| 2. Digital peak meter       | 10. REC. mute button    |
| 3. SPSS indicator           | 11. Pause button        |
| 4. Recording level controls | 12. Stop button         |
| 5. Tape counter             | 13. Fast forward button |
| 6. Dolby NR switch          | 14. Playback button     |
| 7. Tape select switches     | 15. Rewind button       |
| 8. Counter reset button     | 16. Record button       |

## SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with  in the schematic diagram, and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

# STEREO CASSETTE TAPE DECK

## SPECIFICATIONS

Semiconductors:	
Module:	1
ICs:	4
Transistors:	13
Diodes:	15
LED:	13
Track System:	4 track 2 channel stereo
Tape:	Cassette tape (C-30, 60, 90)
Tape Speed:	4.75 cm/s
Recording System and	
Bias Frequency:	AC bias, 85 kHz
Erasing System:	AC erase
Erase Ratio:	65 dB or more (at 1 kHz)
Frequency Response:	
ER/UD (NOR):	20 Hz~17 kHz 30 Hz~15 kHz ( $\pm 3$ dB) 30 Hz~15 kHz*
EX/SX (CrO <sub>2</sub> ):	20 Hz~18 kHz 30 Hz~16 kHz ( $\pm 3$ dB) 30 Hz~16 kHz*
ME (METAL):	20 Hz~18 kHz 30 Hz~17 kHz ( $\pm 3$ dB) 30 Hz~17 kHz*
S/N (Signal to Noise Ratio):	
Dolby NR OFF:	59 dB (Weighted A, Reference 3% THD Metal Tape) 58 dB*

Dolby NR ON:	67 dB (Weighted A, Reference 3% THD Metal Tape) 66 dB*
Wow and Flutter:	0.05% (WRMS) 0.17%*
Input Sensitivity and	
Impedance:	
Line in:	60 mV, 50 kohms or more
Output Level:	500 mV
Output Load Impedance:	
Line out:	50k ohms or more
Distortion:	1.0% (1 kHz 160nWB/m)
Crosstalk:	60 dB or more (at 1 kHz)
Channel Separation:	30 dB or more (at 1 kHz)
Power Supply:	AC 120V, 60 Hz (U, C) AC 100-120V/200-240V 50/60 Hz (W) AC 220V, 50 Hz (FS) AC 240V, 50 Hz (BS, AU)
Power Consumption:	10W
Dimensions:	146(H) x 230(W) x 181(D) mm
Weight:	3.0 kg
Motor:	DC servo motor x 1
Heads:	Metal SL Record/Playback head Three-gap ferrite Erase head

\* According to DIN 45 500

## DISASSEMBLY

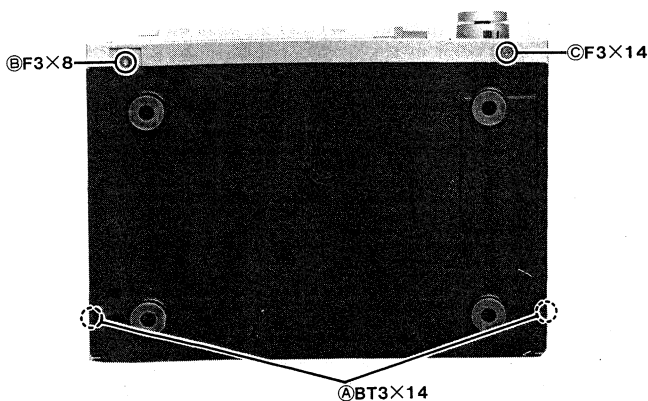


Fig. 1

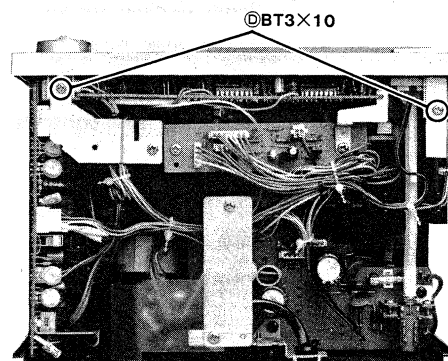


Fig. 2

## 1. Cassette door

Press the eject button to open the cassette tray. Lift up the cassette door to remove it.

## 2. Upper cover

Remove (A) (two) screws.

## 3. Front panel

- 1) Remove two knobs (RECORD L and R).
- 2) Remove (B), (C), (D) and (E) (five) screws.

## 4. Main PC board ass'y

Remove (F) and (G) (three) screws.

## 5. Cassette chassis

Remove the record spring after removing screw (H) then remove (I) (three) screws.

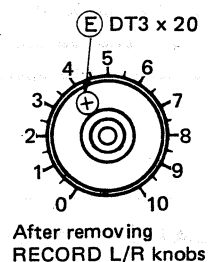


Fig. 3

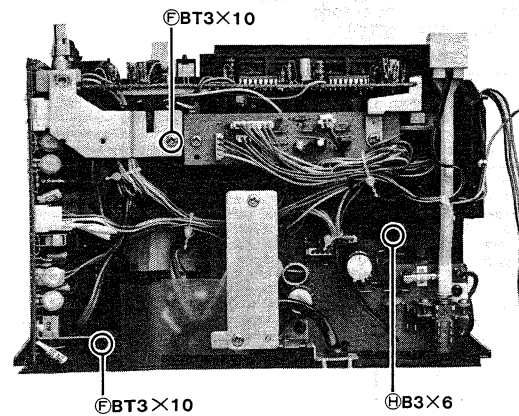


Fig. 4

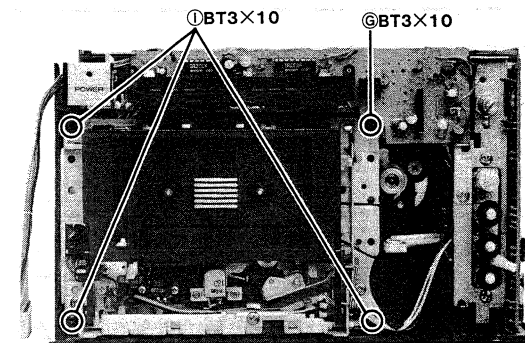


Fig. 5

### ADJUSTMENT

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moisted in alcohol. Also, unless specially indicated otherwise, set the switches and controls to the positions indicated in the table.

Symbol No.	Switches and Controls	Position
S1	Tape select switch	ER/UD(NOR)
S3	RIF switch	II A
S11	Dolby NR switch	OFF
RV1L, R	Record level controls	Max.

\* According to DIN 45 500

Item	Adjustments	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape Speed	• Frequency counter	—	LINE OUT	MTT-111, 3000 Hz (3150 Hz*)	Playback	Semi-variable resistor in the motor	3030 Hz $\pm 10$ Hz (3150 Hz*)	See Note 1
2	Head azimuth	• VTVM	—	LINE OUT	MTT-216 or MTT-316 14 kHz	Playback	Azimuth adjusting screw	Output Max.	See Note 2
3	Playback gain	• VTVM	—	$\ominus$ side of C14L, R	MTT-150, 400 Hz 20m Maxwell	Playback	RT1L, R	775mV(0dB)	See Note 3
4	Digital peak meter	• Audio oscillator (1 kHz) • VTVM	LINE IN	$\ominus$ side of C14L,R	—	Record	RT3L,R	0 dB LED lights up	See Note 4
5	Bias current	• Audio oscillator (1.25kHz/12.5kHz, -4dB - 20dB) • Attenuator • VTVM	LINE IN	LINE OUT	ER/UD Tape	Record/playback	RT4L,R	Output difference within 1 dB	See Note 5
6	Record/playback output level	• Audio oscillator (1 kHz, -4dB) • VTVM	LINE IN	LINE OUT	ER/UD tape	Record/playback	RT2L,R	Output difference within $\pm 0.5$ dB	See Note 6

#### Note:

- Adjust within 30 sec. after heat-running for more than 20 minutes.
- When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.
- Playback a test tape (MTT-150; 400 Hz, 20mMaxwell) and adjust RT1 L, R so that the level of  $\ominus$  side of C14L, R become 775mV.
- 1) Feed a 1 kHz signal to the LINE IN jacks in the recording mode and adjust the audio oscillator output so that the level of  $\ominus$  side of C14L, R becomes 0 dB.  
2) Adjust the RT3L, R so that the 0 dB LED of the peak meter lights up. Then, adjust the attenuator to lower the output level by 1.3 - 1.5 dB.  
3) Readjust the RT3L, R so that the 0 dB LED lights off.  
4) Playback a Dolby test tape (MTT-150; 400 Hz, 20mMaxwell) and check that the 0 dB LED lights up.
- 1) Set the RT4L, R to the center.

- 2) Feed a 1.25 kHz signal to the LINE IN jacks in the recording mode and adjust the audio oscillator output so that the level of LINE OUT becomes -4 dB. Then, adjust the attenuator to lower the output level by 20 dB.
- 3) Record the signal on ER/UD tape with the conditions of item 2), then continue to record with the audio oscillator frequency set to 12.5 kHz.
- 4) Playback the recorded signal and adjust the RT4L, R so that the output level difference between two frequencies is within  $\pm 1$  dB measured at the LINE OUT jacks.
6. 1) Feed a 1 kHz signal to the LINE IN jacks in the recording mode and adjust the audio oscillator output so that the level of the LINE OUT jacks becomes -4 dB.  
2) Record the signal on ER/UD tape with the conditions of item 1).  
3) Playback the recorded signal and adjust the RT2L, R so that the level difference within  $\pm 0.5$  dB.

### INSPECTION OF MECHANISM

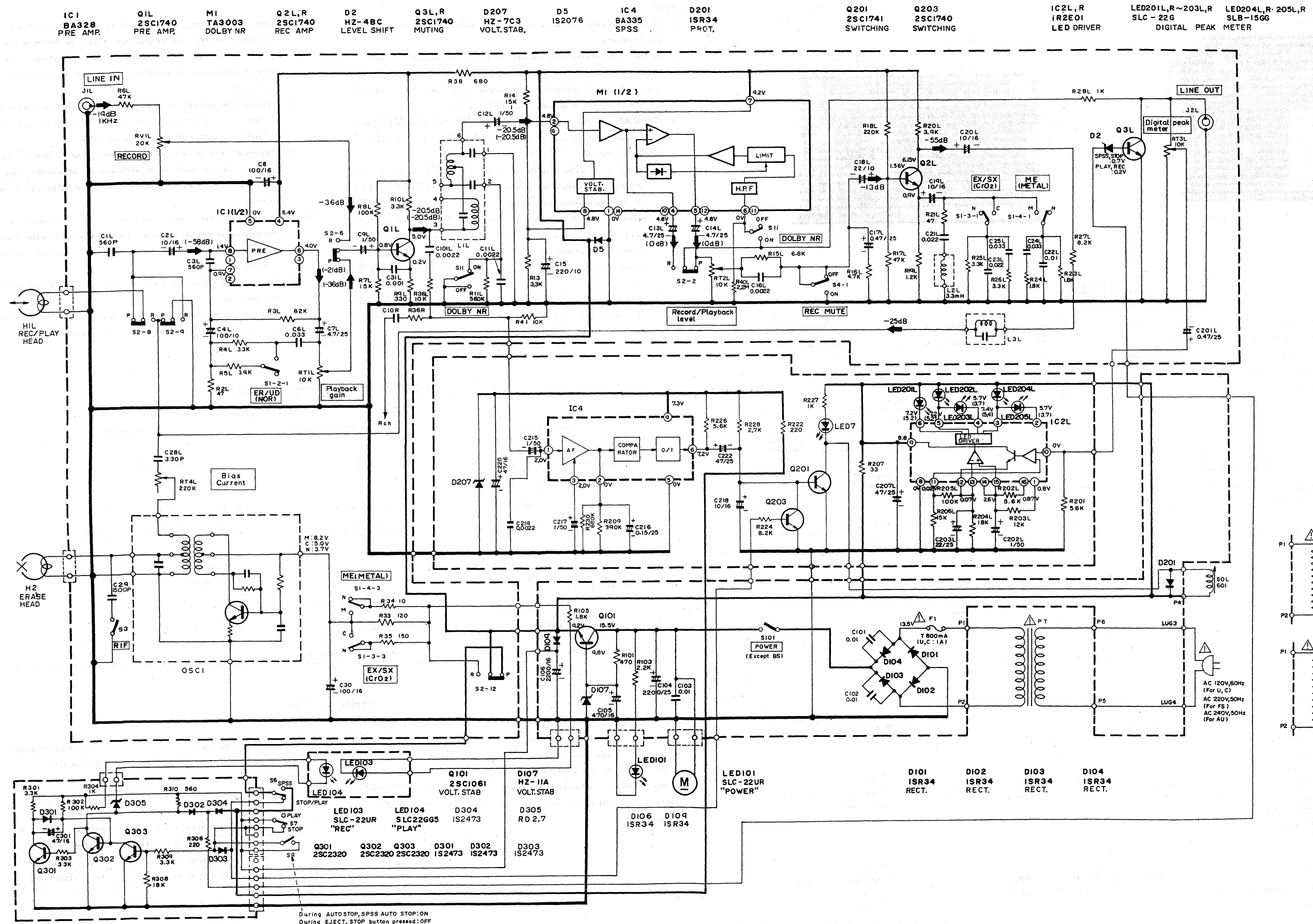
Check Item			Reference Value	Remarks
1	Pressure of Pressure roller		350 $\pm$ 50gr	Measure in playback mode
2	Torque	Take-up	33 to 65 gr-cm	Measure in playback mode
		Fast forward	70 to 120 gr-cm	Measure in Fast forward mode
		Rewind	70 to 120 gr-cm	Measure in Rewind mode
3	Back-tension	Take-up side	6 gr-cm	With counter
		Supply side	1 to 3 gr-cm	Without counter
4	Flywheel thrust gap		0.05 to 0.5 mm	—
5	Brake force		More than 10 gr-cm	—

### LUBRICATION

Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point. Lubricate the respective parts listed below once every 1000 hours or once a year under normal conditions of use. Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication		Oil or Grease
Rotary section	Metal and metal	Pan motor oil (10W - 40)
	Mold and metal	Sonic slider oil (# 1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold Mold and metal	White grease (FL-LUBE-A)
Spring resonance prevention		Froil (GB-TS-1)

## SCHEMATIC DIAGRAM





## CIRCUIT BOARD DIAGRAM

## Note

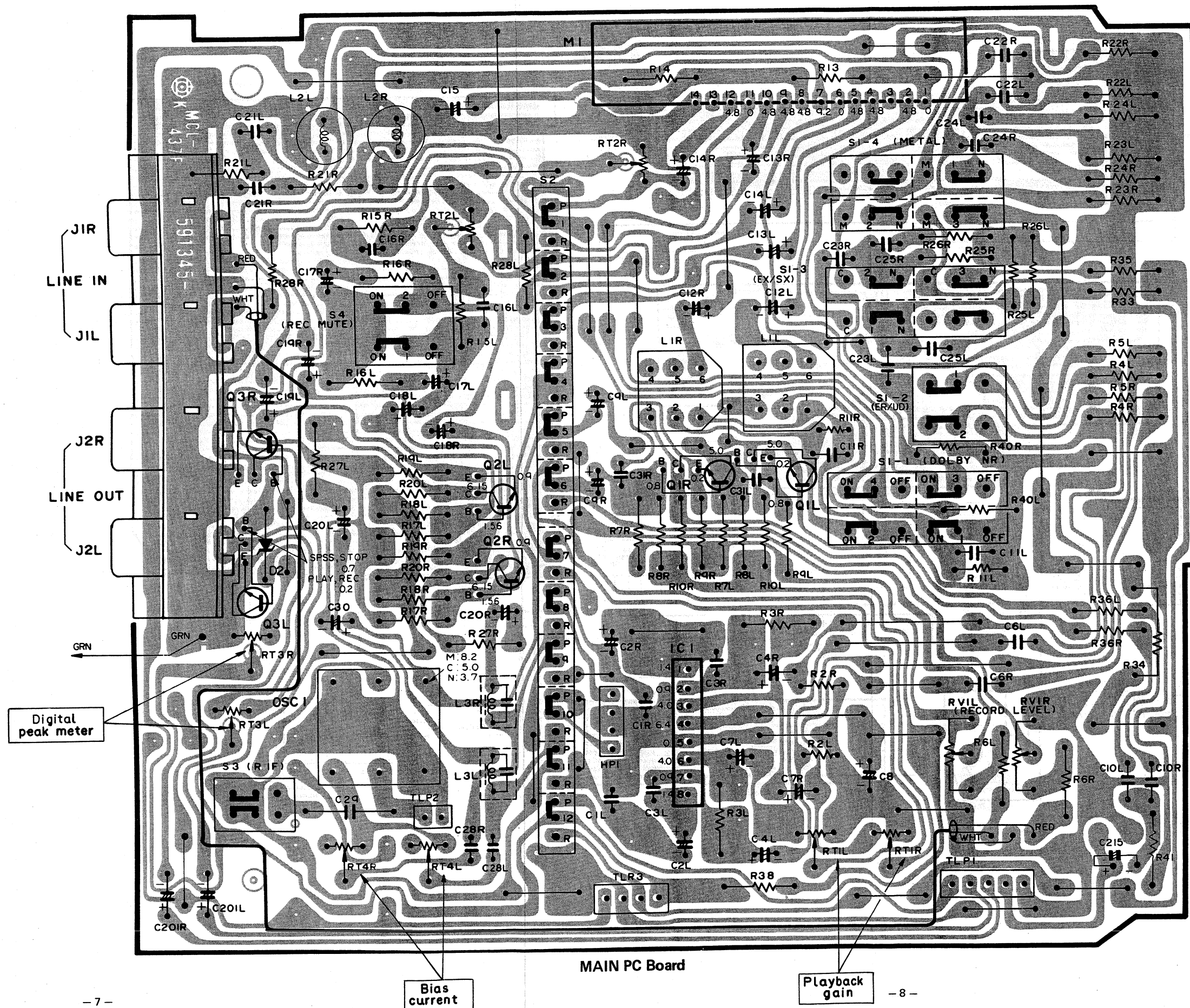
1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.

Circuit No.	
Value	No indicated $\Omega$ (Ohm) M: 1000k $\Omega$
Tolerance	No indicated $\pm 5\%$ K: $\pm 10\%$ M: $\pm 20\%$
Wattage	No indicated $\frac{1}{4}W$
Sort	No indicated Carbon film RC: Composition RW: Wire wound RS: Oxide metal film RN: Fixed metal film

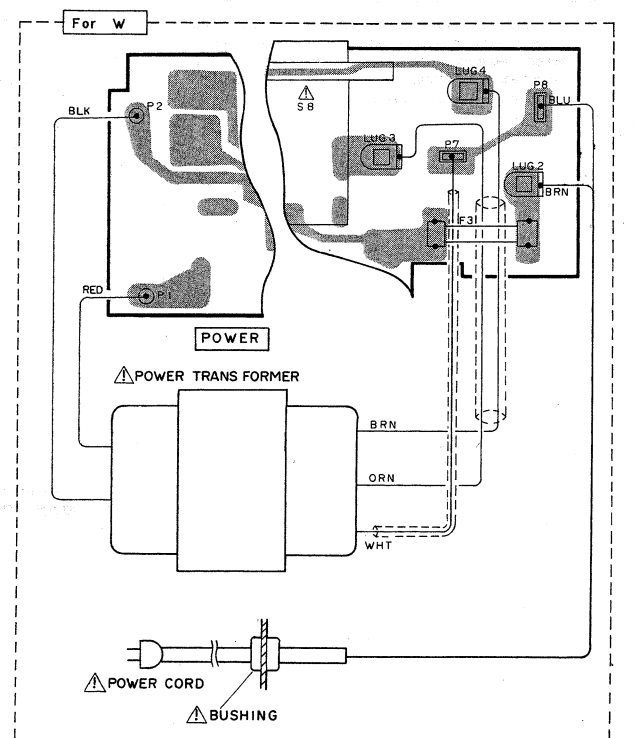
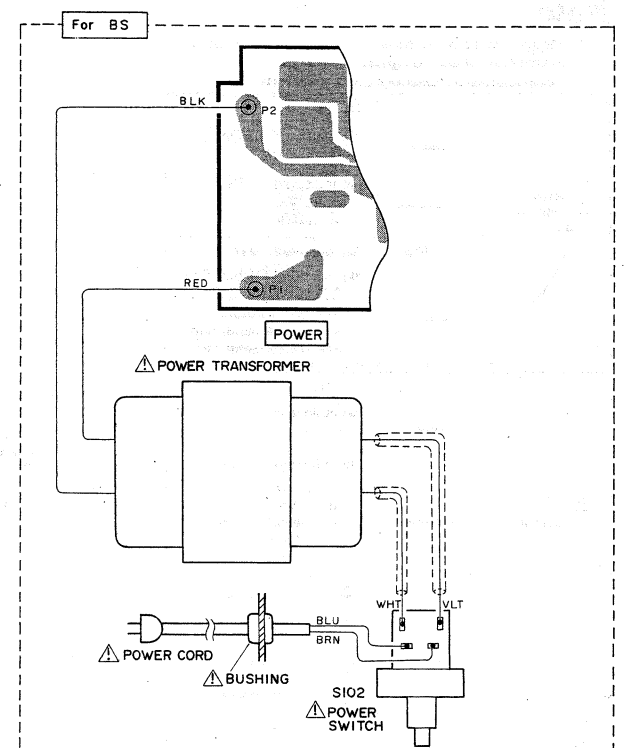
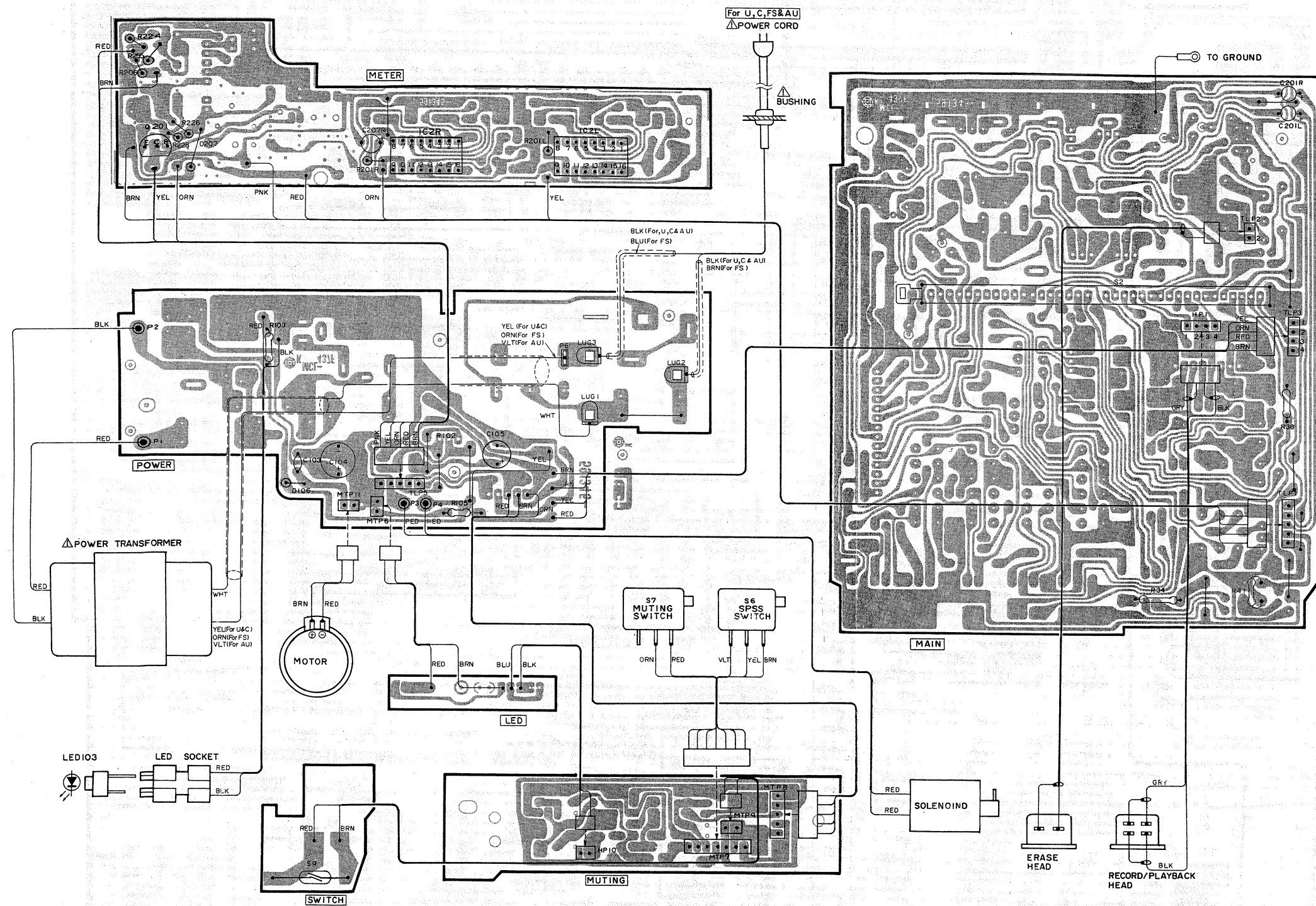
  

Circuit No.	
Value	No indicated $\mu F$ P: PF
Tolerance	No indicated $\pm 10\%$ J: $\pm 5\%$ M: $\pm 20\%$ Z: $+80\%$ , $-20\%$ D: $\pm 0.5pF$ C: $\pm 0.25pF$
Sort	Ceramic
	Electrolytic
	Mylar
	Polyester
Voltage	No indicated 50WV

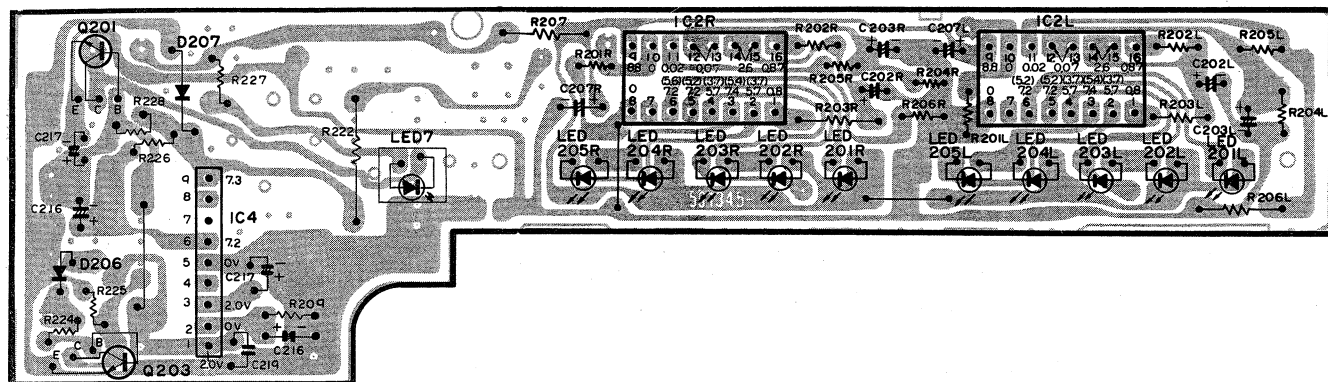
3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with \*, use specified ones stated on parts list since required temperature characteristics.



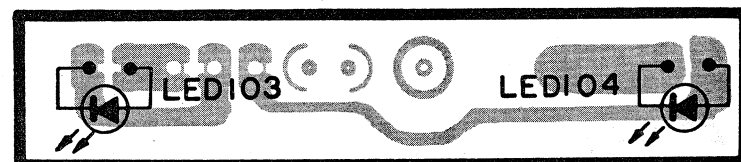
# WIRING DIAGRAM



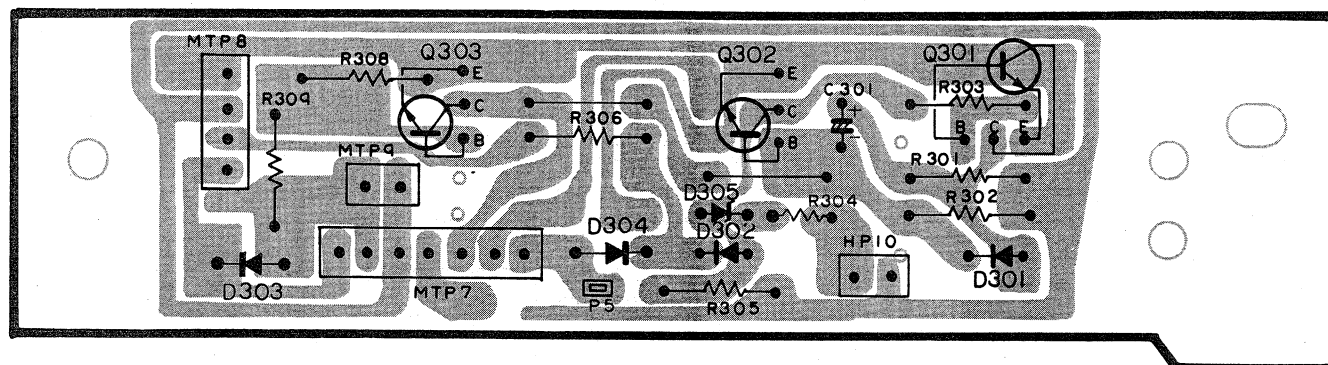




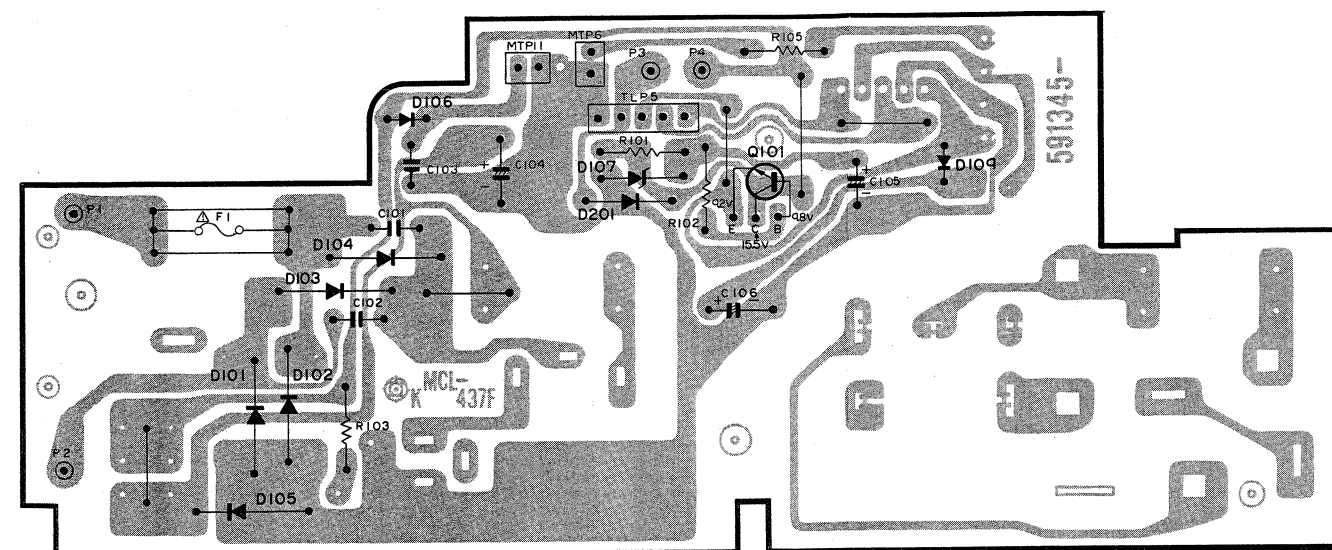
METER PC Board



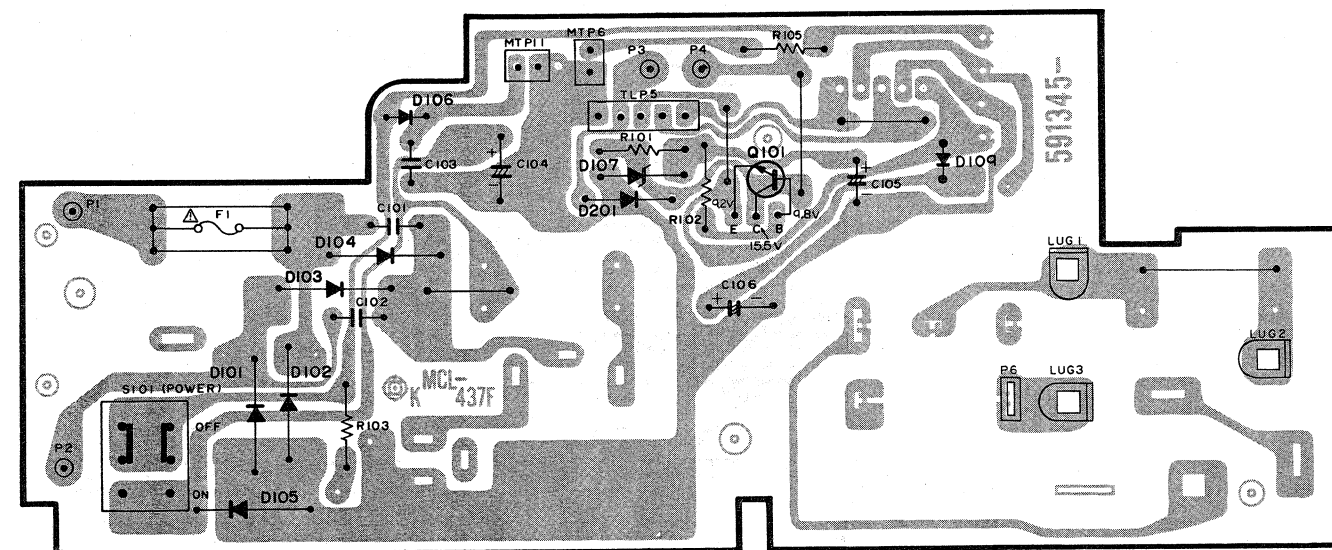
LED PC Board



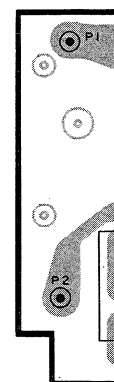
MUTING PC Board



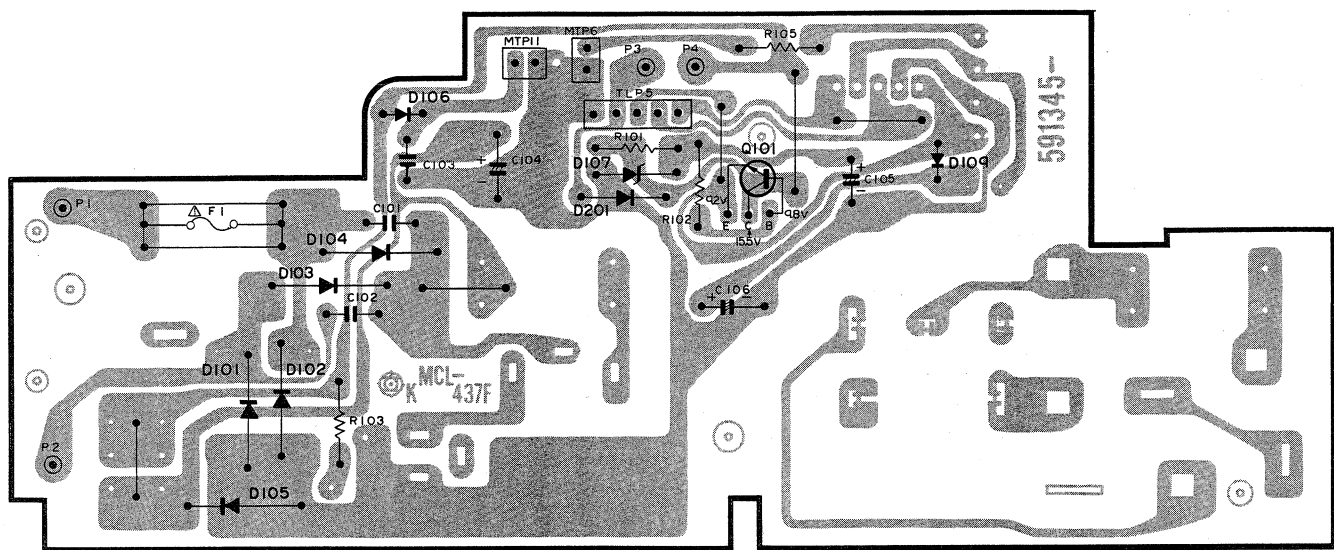
POWER PC Board (For U, C, FS, AU)



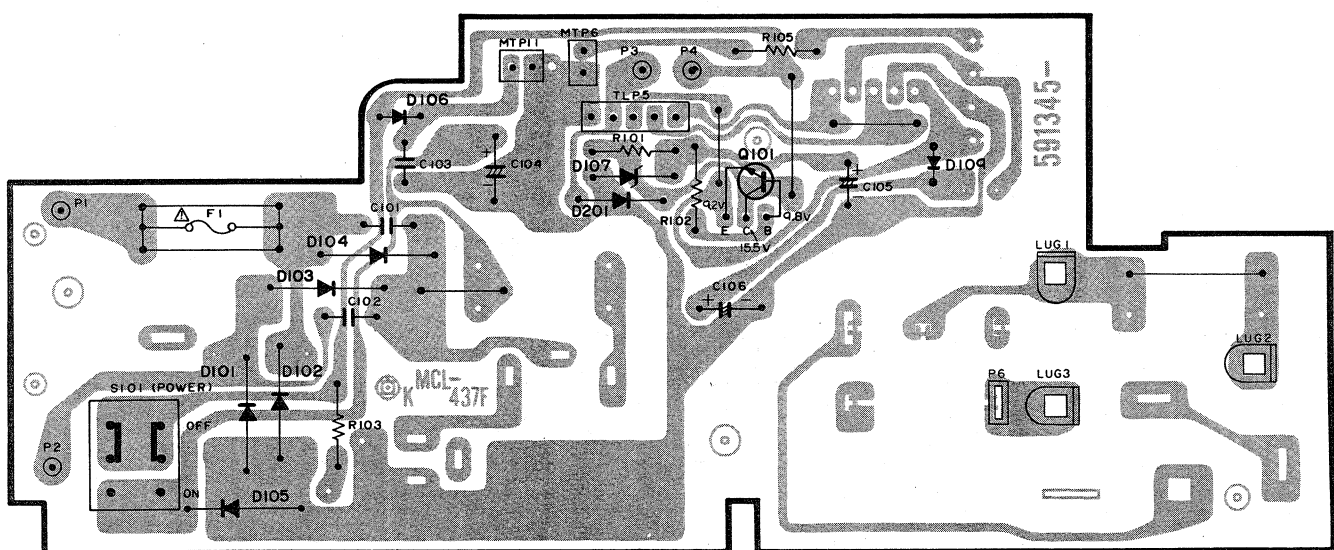
POWER PC Board (For BS)



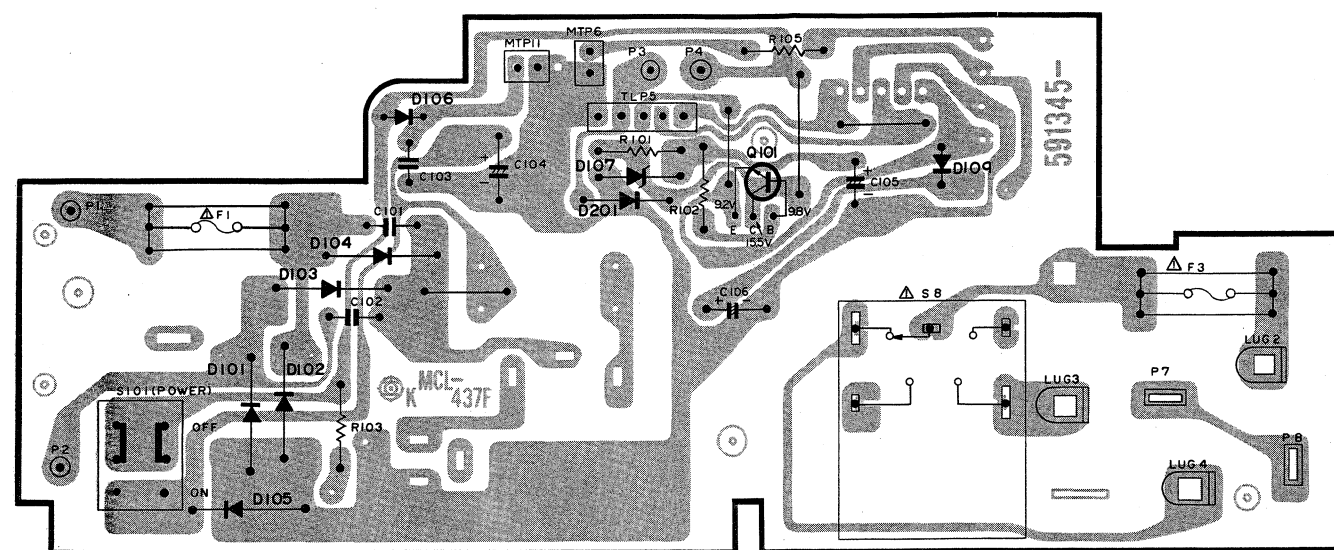
SYMBOL
R 34
K207
RT 1LR
RT 2LR
RT 3LR
RT 4LR
RV 1LR
D 2
D 5
D101-1C
D106
D107
D108
D201
D206
D207
IC 1
IC 2LR
IC 4
LED 7
LED101



POWER PC Board (For U, C, FS, AU)



POWER PC Board (For BS)



POWER PC Board (For W)

REPLACEMENT PARTS LIST

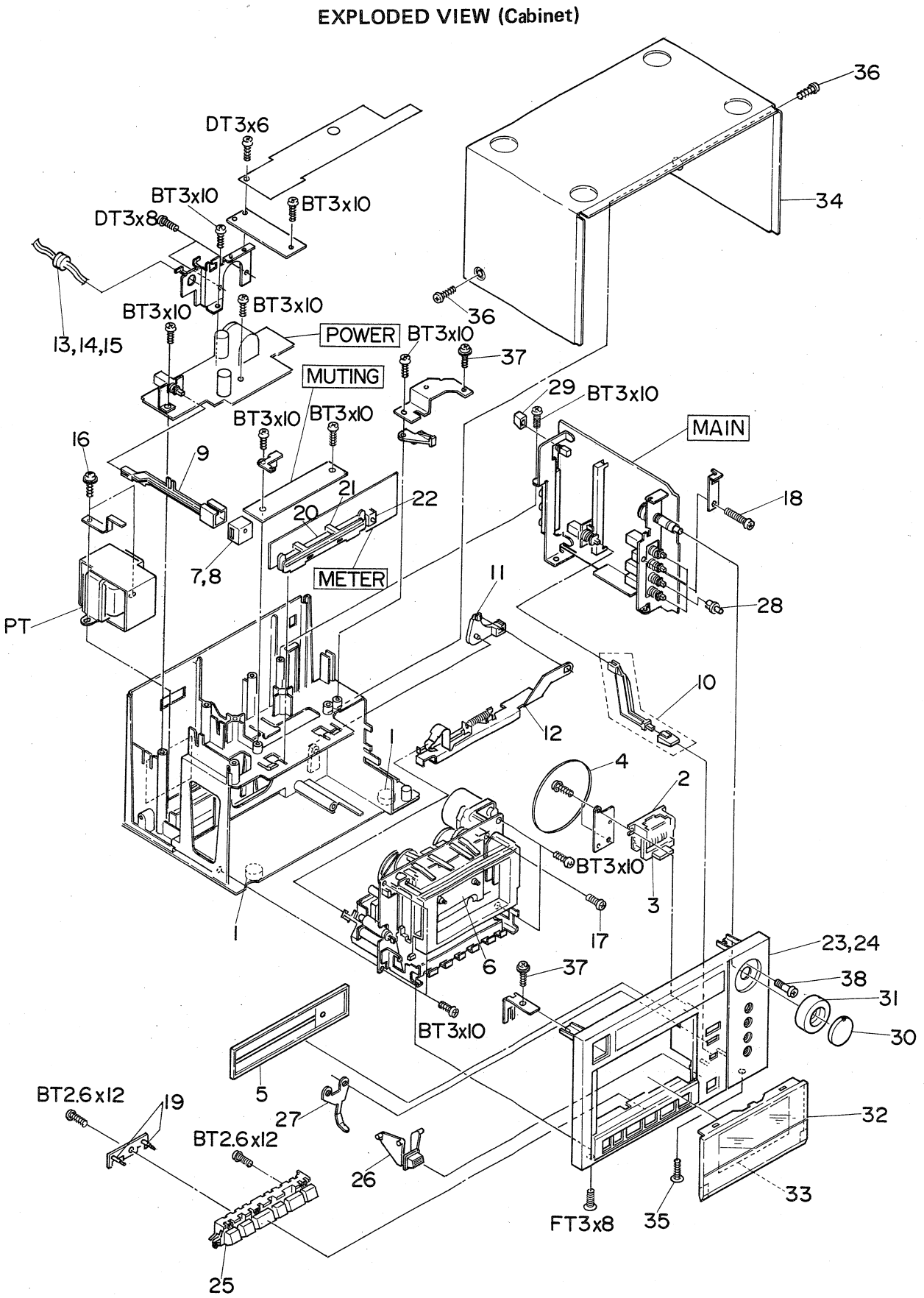
SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
RESISTORS					
R 34	0170474	FUSE RESISTOR 10 OHM+-5% 1/4W	LED103	5380621	LED SLC-22UR
R207	0170481	FUSE RESISTOR 220HM+-5% 1/4W	LED104	5380622	LED SLC22GG5
RT 1LR	5007165	SEMI VARIABLE RESISTOR 10 KOHM	LED201LR	5380552	LED SLB-15UG
RT 2LR	5007186	SEMI VARIABLE RESISTOR 10 KOHM	LED202LR	5380552	LED SLB-15UG
RT 3LR	5007186	SEMI VARIABLE RESISTOR 10 KOHM	LED203LR	5380552	LED SLB-15UG
RT 4LR	5007196	SEMI VARIABLE RESISTOR 220 KOHM	LED204LR	5380551	LED SLB-15UR
RV 1LR	5000841	VARIABLE RESISTOR 20 KOHM(A)	LED205LR	5380551	LED SLB-15UR
SEMI-CONDUCTORS			M 1	5356832	MODULE TA3003
D 2	5330711	ZENER DIODE HZ4BC	Q 1LR	5321295	TRANSISTOR 2SC1740E
D 5	5330133	DIODE SILICON 1S2076 100MHZ 250MW	Q 2LR	5321295	TRANSISTOR 2SC1740E
D101-104	5331241	DIODE 1SR34	Q 3LR	5321295	TRANSISTOR 2SC1740E
D106	5331242	DIODE 1SR34	Q101	5320671	TRANSISTOR SILICON 2SC1061B
D107	5330551	ZENER DIODE HZ11A	Q201	5322213	TRANSISTOR 2SC1741R
D108	5330574	DIODE 1S2473	Q202	5321295	TRANSISTOR 2SC1740E
D201	5331242	DIODE 1SR34	Q203	5321295	TRANSISTOR 2SC1740E
D206	5330571	DIODE 1S2473VE	TRANSFORMERS		
D207	5330315	ZENER DIODE HZ7C3	△ PT	5211356	POWER TRANSFORMER (U)
IC 1	5350712	IC BA329	△ PT	5211357	POWER TRANSFORMER (C)
IC 2LR	5352401	IC IR2E01	△ PT	5211932	POWER TRANSFORMER (BS, AU)
IC 4	5352033	IC BA335	△ PT	5211933	POWER TRANSFORMER (FS)
LED 7	5380242	LED GL-3PR1	△ PT	5212056	POWER TRANSFORMER (W)
LED101	5380621	LED SLC-22UR			



SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
COILS			5	6763977	METER FRAME ASSEMBLY
L 1LR	5161664	DOLBY FILTER	6	6634211	CASSETTE METAL
L 2LR	5150361	CHOKE COIL	7	6053633	PUSH BUTTON (POWER) [U,C,BS,AU,W]
L 3LR	5120562	TRAP COIL	8	6053634	PUSH BUTTON (POWER) [FS]
MISCELLANEOUS			9	6763572	LEVER FOR POWER SWITCH
	5658062	LED SOCKET (FOR POWER BUTTON LED)	10	6763491	PUSH BUTTON ASSEMBLY (REC MUTE)
△	5659121	POWER CORD (U, C)	11	6763582	RECORD ARM
△	5746158	POWER CORD (FS, W)	12	7339341	RECORD LEVER ASSEMBLY
△	5746571	POWER CORD (AU)	△	13	6794081 BUSHING (FS, W)
△	5746342	POWER CORD (BS)	△	14	6711351 BUSHING (BS)
△ F 1	5720175	FUSE 0.8A (FS, BS, AU, W)	△	15	0043793 BUSHING (U, C, AU)
△ F1	5721164	FUSE 1A (U, C)	16	7781132	BT SCREW -3MMDx10MM
△ F 3	5720172	FUSE 250V 0.4A 250 MA [W]	17	0678316	DT SCREW-2.6MMDx16MM(BLACK)
J 1LR	5676261	PIN JACK ASSEMBLY (LINE IN)	18	8671420	DT BIND SCREW-3MMDx20MM
J 2LR	5676261	PIN JACK ASSEMBLY (LINE OUT)	19	6749481	LED SPACER
OSC1	5260841	OSCILLATOR BLOCK	20	6763521	LED HOLDER
S 1	5634356	PUSH SWITCH (TAPE SELECTOR)	21	6763531	LED STOPPER
S 2	5623306	SLIDE SWITCH (REC./P.B.)	22	6764171	LED SPACER
S 3	5633311	PUSH SWITCH (RIF)	MISCELLANEOUS		
S 4	5634355	PUSH SWITCH (REC MUTE)	23	6224203	FRONT PANEL ASSEMBLY (U, C, BS, AU, W)
S 6	5633361	PUSH SWITCH (SPSS)	24	6224204	FRONT PANEL ASSEMBLY (FS)
S 7	5633361	PUSH SWITCH (MUTING)	25	6765823	FUNCTION BUTTON ASSEMBLY
△ S 8	5605122	ROTARY SWITCH (VOLTAGE SELECTOR) [W]	26	6290622	EJECT BUTTON ASSEMBLY
S 9	5641091	REED SWITCH	27	6329802	SPRING FOR EJECT BUTTON
S11	5634356	PUSH SWITCH (DOLBY NR)	28	6053641	PUSH BUTTON (DOLBY NR, TAPE SELECTOR)
△ S102	5633541	PUSH SWITCH (POWER) [BS]	29	6259761	PUSH BUTTON (RIF)
△ S101	5634354	PUSH SWITCH (POWER) [U, C, FS, AU, W]	30	6290602	KNOB ASSEMBLY (RECORD L)
FOR ACCESSORIES :			31	6290612	KNOB ASSEMBLY (RECORD R)
7740321 HEAD CLEANING STICK			32	6093062	CASSETTE DOOR
5895501 PATCH CORD			33	6099451	DOOR PANEL
△	5662021	SOCKET ADAPTER (W)	34	6043411	UPPER COVER
FOR CASSETTE DECK ASSEMBLY (B)			35	7781583	BT FLAT SCREW-3MMDx14MM
1	7740372	FELT LEG	36	8698414	BT SCREW-3MMDx14MM
2	5559263	COUNTER	37	7781132	BT SCREW-3MMDx10MM
3	6753287	RESET BUTTON	38	8671420	DT BIND SCREW-3MMDx20MM
4	6355271	COUNTER BELT			

Type of head					
P	Pan head screw	BT	Binding head tapping screw		
F	Flat countersunk head screw	BL	Bolt		
B	Binding head screw	W	Washer		
T	Round head tapping screw	E	"E" ring		
Length (L mm)					
Diameter (D mm)					

When ordering hardware excluding stated on these lists, be sure to make your orders with type and size.



Note: 1. Components marked without numbers in this drawing are not specified as replacement parts.  
2. Replacement parts list and exploded view of the cassette chassis, refer to ML-1 Mechanism Technical Information (No. 1473).